

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 15

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte RICHARD HENRY DEE and BRADLEY NEAL ~~TECHNOLOGY CENTER 2600~~

DIRECTOR'S OFFICE
TECHNOLOGY CENTER 2600

Appeal No. 2005-0154
Application 09/894,379

ON BRIEF

MAILED

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U.S. PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Before FRANKFORT, DIXON, and BAHR, Administrative Patent Judges.

FRANKFORT, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's final rejection of claims 1 through 36, all of the claims pending in this application.

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Appellants' invention relates to a reduced sensitivity spin valve head disclosed as being used for magnetic tape applications and to a method of making such a sensor apparatus. In the magnetic tape environment, appellants seek to retain much of the benefits of standard spin valve sensors currently used for reading hard disk drives, but must provide compensation for excessive input flux present in magnetic tape applications that may overpower such spin valve sensors. More specifically, as noted on page 6 of the specification, in order to provide a reduced sensitivity spin valve sensor, one or more of the basic sensitivity of the spin valve, the flux carrying capability of a free layer, and a flux injection efficiency of the spin valve head structure are modified to reduce the flux capture by the sensing layer. Claims 1, 7 and 11 are representative of the subject matter on appeal, and a copy of those claims can be found in the Appendix to appellants' brief.

The prior art references of record relied upon by the examiner in rejecting the claims on appeal are:

Tobise et al. (Tobise)	5,748,416	May 05, 1998
Miyauchi et al. (Miyauchi)	5,852,533	Dec. 22, 1998

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Claims 1 through 6, 10 through 16 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Tobise.

Claims 1, 7 through 9, 11, 17 through 19 and 21 through 36 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Miyauchi.

Rather than reiterate the examiner's specific commentary regarding the above-noted rejections and the conflicting viewpoints advanced by the examiner and appellants regarding those rejections, we make reference to the examiner's answer (Paper No. 13, mailed May 18, 2004) for the reasoning in support of the rejections, and to appellants' brief (Paper No. 11, filed March 26, 2004) for the arguments thereagainst.

As a preliminary matter, we note appellants' indication on page 3 of their brief that claims 1-6, 10-16, and 20 form a Group A, while claims 7-9, 17-19, and 21-26 [sic, 36] form a Group B. We understand these groupings to indicate that the claims in each grouping will stand or fall together. Thus, in the following discussion only independent claims 1 and 11 and dependent claim 7 will be separately discussed. Per appellants' groupings, claims

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2 through 6, 10 through 16 and 20 will stand or fall with our determination concerning the patentability of independent claims 1 and 11, while claims 8, 9, 17 through 19 and 21 through 36 will stand or fall with our determination concerning the patentability of dependent claim 7.

OPINION

In reaching our decision in this appeal, we have given careful consideration to appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by appellants and the examiner. As a consequence of our review, we have made the determination that the examiner's above-noted rejections will be sustained. Our reasons follow.

Before we look to the prior art, we note that independent claims 1 and 11 on appeal are readable on the embodiment seen in Figure 8 of the present application, wherein the spin valve sensor apparatus comprises, *inter alia*, a spin valve sensor (810) and permanent magnet stabilizing elements (860, 870) that serve as a magnetic effect inducing device for inducing a magnetic field to the spin valve sensor to thereby reduce a sensitivity of

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a free layer of the spin valve sensor to an applied magnetic field (i.e., to magnetically increase the "stiffness" of the free layer or sensing layer of the spin valve sensor.) See pages 16-17 of the specification for a description of this embodiment and specifically the indication on page 17 that

[b]y stiffening the free layer of the spin valve sensor 810, what is meant is that the amount of magnetic field required to cause the magnetization direction of the free layer of the spin valve sensor to rotate away from the easy-axis is increased and the sensors propensity to saturate is reduced. As a result, the voltage output of the spin valve sensor 810 is reduced.

Independent claims 1 and 11 are also readable on the embodiment seen in Figure 9 of the present application, as is dependent claim 7, wherein the spin valve sensor apparatus comprises, *inter alia*, a spin valve sensor (920) and an antiferromagnetic layer (910) applied as an overlay to the free layer of the spin valve sensor, which antiferromagnetic layer serves as a magnetic effect inducing device for inducing a magnetic field to the spin valve sensor to thereby reduce a sensitivity of the free layer of the spin valve sensor to an applied magnetic field (i.e., to magnetically increase the stiffness of the free layer of the spin valve sensor.) See pages 17-18 of the specification for a description of this embodiment.

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Looking now to the examiner's rejection of claims 1 through 6, 10 through 16 and 20 under 35 U.S.C. § 102(b) as being anticipated by Tobise, we note the examiner's reliance on the spin valve magnetoresistive playback head (MR head) seen in Figure 15 of Tobise used for reading magnetic data signals from a magnetic recording medium. In this instance, the examiner is of the view that the apparatus of Tobise's Figure 15, which is similar to Figure 8 of the present application, comprises a spin valve sensor with a free layer (11) and at least one magnetic effect inducing device in the form of permanent magnets (21) for inducing a magnetic field to the spin valve sensor to thereby reduce a sensitivity of the free layer of the spin valve sensor to an applied magnetic field (i.e., to magnetically increase the stiffness of the free layer of the spin valve sensor.) The examiner specifically points to the disclosure of Tobise at column 12, lines 50-54, and column 14, lines 45-48 and lines 15-27, as describing a MR head like that claimed by appellants, i.e., a reduced sensitivity spin valve sensor apparatus.

In considering appellants' arguments in their brief, while we agree with appellants that an objective of the invention in Tobise is to produce a MR head that is highly sensitive and

limits Barkhausen noise by optimizing the magnetic properties of the permanent magnet film, we nonetheless also find (as the examiner has) that this patent discloses certain comparative examples of MR heads that clearly have reduced sensitivity and a corresponding decreased output. Note, for example, a MR head like that discussed in column 5, lines 11-21, of Tobise and those depicted in Figure 7 of the patent at graph points having an (r) value of 3, 4 and 5. Clearly the spin valve MR heads having an (r) value of 3, 4 and 5 each have a reduced output and decreased sensitivity compared to MR heads with an (r) value of 2 or less as shown in Figure 7. Although the MR heads like that in Figure 15 having an (r) value of 3, 4 and 5 in Figure 7 are not the preferred embodiments in Tobise, they are nonetheless adequately described therein to allow one of ordinary skill in the art to make and use them. Thus, it is those non-preferred embodiments in Tobise which we see as anticipating appellants' broadly claimed reduced sensitivity spin valve sensor apparatus and method of making the same.

Based on the foregoing, we will sustain the examiner's rejection of independent claims 1 and 11 under 35 U.S.C. § 102(b) as being anticipated by Tobise, and that of claims 2 through 6,

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10 through 16 and 20 which fall with our determination regarding independent claims 1 and 11.

As for the rejection of claims 1, 7 through 9, 11, 17 through 19 and 21 through 36 under 35 U.S.C. § 102(b) as being anticipated by Miyauchi, we agree with the examiner's position as set forth on pages 4-5 of the answer that at least one non-preferred embodiment of the invention therein, i.e., that reflected in the disclosure of Miyauchi at column 7, lines 58-64 and shown generally in Figures 3 and 4, is anticipatory of appellants' broadly claimed reduced sensitivity spin valve sensor apparatus and method of making the same as set forth in independent claims 1 and 11 on appeal. Moreover, as in appellants' dependent claim 7, the spin valve sensor of Figures 3 and 4 of Miyauchi has a magnetic effect inducing device in the form of an antiferromagnetic layer (126) to provide an exchange-coupling with the ferromagnetic free layer (121) of the spin valve sensor so that an exchange bias magnetic field is applied to or induced in the ferromagnetic sensor layer (121). As indicated in column 7, lines 58-64, when the exchange bias magnetic field in sensor layer (121) becomes too large, the reversal of magnetization of layer (121) is dulled, reducing the

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magnetic field sensitivity. Thus, although it is the desire in Miyauchi to provide a spin valve sensor in which the sensitivity is not reduced, it nonetheless also provides a teaching as to exactly how one of ordinary skill in the art at the time of appellants' invention would make a reduced sensitivity spin valve sensor apparatus, i.e., by providing an antiferromagnetic layer (126) that induces a bias field in the free layer (121) greater than the minimum noted in Miyauchi. For that reason, we will sustain the examiner's rejection of claims 1, 7 and 11 under 35 U.S.C. § 102(b) based on Miyauchi.

Given appellants' grouping of the claims (brief, page 3), it follows that claims 8, 9, 17 through 19 and 21 through 36 will fall with our determination concerning the patentability of claim 1, 7 and 11.

Thus, the examiner's rejection of each of the claims on appeal under 35 U.S.C. § 102(b) is sustained and the decision of the examiner is affirmed.

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv).

AFFIRMED

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